

Convert Pneumatics to Mechanical Controls



Partner Reported Opportunities (PROs) for Reducing Methane Emissions

PRO Fact Sheet No. 301

Applicable sector(s):

Production Processing Transmission and Distribution

Partners reporting this PRO: ExxonMobil Production Company

Other related PROs: Convert Gas Pneumatic Controls to Instrument Air

Compressors/Engines	<input type="checkbox"/>
Dehydrators	<input type="checkbox"/>
Pipelines	<input type="checkbox"/>
Pneumatics/Controls	<input checked="" type="checkbox"/>
Tanks	<input type="checkbox"/>
Valves	<input type="checkbox"/>
Wells	<input type="checkbox"/>
Other	<input type="checkbox"/>

Technology/Practice Overview

Description

Remote, non-electrified gas production, processing, transmission, and distribution sites often use natural gas powered pneumatic controllers for automatic process control, resulting in significant methane emissions to the atmosphere. Some partners have reported converting these controls to mechanical devices.

The most common mechanical control device is a level controller, which translates the position of a liquid-level float to the drain valve position with mechanical linkages. There is no gas usage in either the process measurement or valve actuation, and reliability is very high.

Operating Requirements

External mechanical linkages must be maintained and well lubricated.

Applicability

This technology is applicable to all gas-powered pneumatic controllers where the process measurement can be close to the flow control valve.

Methane Emissions Reductions

The mechanical device eliminates both the process controller bleed and the valve actuation vent emissions. A rule of thumb for evaluating gas emissions from process controls is one scf per minute of gas for each control loop, consisting of the process measurement and valve actuator.

Methane Savings: 500 Mcf per year

Costs

Capital Costs (including installation)

<\$1,000 \$1,000 – \$10,000 >\$10,000

Operating and Maintenance Costs (annual)

<\$100 \$100-\$1,000 >\$1,000

Payback (Years)

0–1 1–3 3–10 >10

Benefits

Reducing methane emissions was a primary justification for the project.

Economic Analysis

Basis for Costs and Savings

Methane emissions savings of 500 Mcf per year are associated with modifying one liquid-level control loop, consisting of the process measurement and valve actuation, assuming a methane content in the natural gas of 95 percent.

Discussion

This technology can pay back quickly. The cost of a mechanical process control system involves both the process measurement equipment and the valve mechanical actuator. This cost may also require some piping modifications to bring the control valve into close proximity with the process measurement, or alternatively, to bring the process measurement (e.g., pressure) close to the flow control valve.